

WHAT IS CLAIMED IS:

1. A method of fabricating an orifice plate for use
5 in an ink jet printing system, comprising the steps
of:

providing a substrate base;

applying a controlled-release layer to a
surface of the substrate base;

10 adherently coating a conductive metal
layer on the controlled-release layer;

creating at least one dielectric peg on
a portion of the conductive metal layer;

15 applying a nozzle layer on the
conductive metal layer wherein the nozzle layer
partially covers the at least one dielectric peg;

using photolithography to define a
trench that covers the nozzles prior to formation of
a second reinforcing layer;

20 removing the controlled-release layer to
separate the orifice plate from the substrate base;

selectively etching the conductive metal
layer from the nozzle layer to produce a completed
multi-layer orifice plate.

25 2. A method as claimed in claim 1 wherein the
substrate base comprises a metal substrate not
attacked by chemicals used in electroforming
processes.

30 3. A method as claimed in claim 1 wherein the
substrate base comprises a chrome coated glass
substrate.

4. A method as claimed in claim 1 wherein the controlled-release layer comprises an organic chemical layer.

5 5. A method as claimed in claim 4 wherein the organic chemical layer comprises a photoresist.

6. A method as claimed in claim 1 wherein the conductive metal layer comprises a copper layer.

10 7. A method as claimed in claim 1 wherein the conductive metal layer comprises a conductive layer having an approximate thickness of 0.1 micron.

15 8. A method as claimed in claim 1 wherein the step of adherently coating comprises the step of sputtering.

20 9. A method as claimed in claim 1 wherein the controlled-release layer comprises a controlled-release layer having an approximate thickness of 0.5 micron.

25 10. A method as claimed in claim 1 wherein the controlled-release layer comprises a controlled-release layer applied to the substrate base by spin coating.

30 11. A mandrel for use in fabricating three dimensional electroformed structures comprising:
a substrate base;
a controlled-release layer applied to at least one surface of the substrate base; and
a conductive metal layer applied to the conductive-release layer wherein the conductive

metal layer provides a surface upon which to
electroform the structure to which the substrate
base provides rigidity, the mandrel and the
controlled-release layer provide sufficient adhesion
5 to the substrate base to prevent the electroformed
structure from delaminating from the substrate base
during the electroforming processes and still
provide a means to remove the electroformed
structure from the substrate base without damage to
either the electroformed structure or the substrate
base.

10
12. A mandrel as claimed in claim 11 wherein the
substrate base comprises a metal substrate not
attacked by chemicals used in electroforming
processes.

15
13. A mandrel as claimed in claim 11 wherein the
substrate base comprises a chrome coated glass
substrate.

20
14. A mandrel as claimed in claim 11 wherein the
controlled-release layer comprises an organic
chemical layer.

25
15. A mandrel as claimed in claim 11 wherein the
controlled-release layer comprises a controlled
release layer whereby the electroformed substrate
can be removed from the substrate base by chemically
30 dissolving the controlled-release layer.

35
16. A mandrel as claimed in claim 11 wherein the
controlled-release layer comprises a controlled-
release layer whereby the electroformed substrate
can be removed from the substrate base by melting

the controlled-release layer.

17. A mandrel as claimed in claim 11 wherein the controlled-release layer comprises a brittle
5 controlled-release layer.

18. A mandrel as claimed in claim 17 wherein the electroformed structure can be removed from the substrate base by fracturing the brittle controlled-
10 release layer.

19. An orifice plate for use in an ink-jet printer made using a mandrel as claimed in claim 11.

15 20. A three dimensional structure made using a mandrel as claimed in claim 11.